ments in soaps, dispersant and accelerator were made so that the casts were substantially similar, the % PCE Reduction was calculated as the difference in the amount of PCE used as a percentage of the amount of PCE used in the control sample.

TABLE 2

Run #	CSA, g	PCE, g	Dose, %	Retarder, lbs/MSF	Slump, cm	Stiff, sec	% PCE Reduction
1	2.6	2.57	0.150	0.05	18.0	100	Control
2	2.9	2.40	0.140	0.10	18.0	100	6.6
3	3.2	2.10	0.123	0.15	17.5	100	18.3
4	4.0	1.60	0.093	0.25	18.0	105	37.7

The % PCE reduction shown in these runs is non-linear and is indicative of a synergistic effect between this retarder and the dispersant with a defoaming moiety attached.

EXAMPLE 3

About 600 grams of calcined gypsum from a western gypsum source was used to make a slurry having a water stucco ratio (WSR) of 0.730. This WSR was selected in order to achieve a slump patty size of 18±0.5 cm without any dispersant or retarder.

Foam was generated in a separate foam generator and added to the mixer during the last part of the mixing time. The foam was prepared with a foam generator from a mixture of soap and foam water that included about 0.75% soap. The soap was added with various blends of HYONIC PFM-33 (Geo Specialty Chemicals, Lafayette, Ind.) and Steol CS-330 (Stepan Co., Northfield, Ill.) to produce a similar core void distribution in all cases. The following procedure describes the remaining process conditions.

The mixing sequence and procedure follows:

1. Water, any dispersant, and additives were placed in the Hobart mixer bowl and then mixed by hand.

2. Stucco pre-blended with accelerator and specific additives were added to the bowl and soaked for a short time before the mechanical mixing begins.

3. During mixing, foam was added for density control. The amount of foam addition varied depending on the targeted density.

4. The slurry was mixed for an additional time after the foam addition ends.

5. The slurry was then tested for slump, stiffening time, density, and core structure.

If the amount of foam was changed to achieve the desired density, the gauging water was adjusted to balance the change in foam water. The amount of dispersant remained constant in Run #3 and Run #4 when comparing slurries made with and without retarder. Similarly, the amount of retarder remained constant in Run #2 and Run #4 when comparing slurries made with and without dispersant.

Amount of accelerator was adjusted to achieve the desired stiffening time of 115±5 seconds, and the WSR was adjusted to maintain a target slump of 18±0.5 cm throughout the study.

Change in the amount of dispersant or WSR can change the foaming characteristics of the slurry, therefore the amount of foam was varied to achieve the dry density target of 41±1 lbs/ft^3. A portion of the slurry was used to fill a 207 ml cup measuring 9.1 cm in height. If the slurry settled more than 2 mm from the rim of the cup while the cast was setting, the foam was not sufficiently stable and the test was repeated with a higher concentration of stable soap. Inspection of the interior of the gypsum cast revealed the bubble structure. If all samples had small bubbles, the test was repeated with a lower soap concentration. If very large, oblong or irregularly shaped bubbles were found, the test was repeated with a higher soap concentration. Adjustments in soaps, accelerator and water were made until the products of each condition were substantially similar. The "WSR Reduction" was calculated by comparing the difference of WSR for each condition versus the control sample from Run #1.

In Table 3 that follows, "Retarder" refers to the amount of retarder in lbs/MSF, "stiff" refers to stiffening time in seconds and "CSA" refers to the amount of CSA accelerator in grams.

"Dispersant" indicates the type of dispersant, while "Dispersant (g)" indicates the amount of dispersant, on a wet basis at 35% solids. "Dose" is the dry-basis amount of dispersant expressed in percent of the dry calcined gypsum weight.

The WSR Reduction of Run #4 with PCE-410 dispersant and retarder was 0.095. This is greater than the sum of the individual effects of Run #2 (the impact of retarder alone which is 0.010 WSR Reduction) and Run #3 (the impact of PCE alone which is 0.075 WSR Reduction). This demonstrates a synergistic effect between this retarder and dispersant with a defoaming moiety attached thereto.

While particular embodiments of the foamed slurry and building panel made therefrom have been shown and described, it will be appreciated by those skilled in the art that changes and modifications may be made thereto without departing from the invention in its broader aspects and as set forth in the following claims.

TABLE 3

Run #	WSR	CSA (g)	Dispersant	Dose (%)	Dispersant (g)	WSR Reduction vs Run#1	Retarder (lb/MSF)	Slump (cm)	Stiff (sec)
1	0.730	1.0	None	0.000	0.00		0	17.8	120
2	0.720	1.4	None	0.000	0.00	0.010	0.15	17.5	120
3	0.655	2.0	PCE-410	0.106	1.81	0.075	0	17.5	110
4	0.635	2.6	PCE-410	0.106	1.81	0.095	0.15	17.8	115

This set of tests included four conditions, for slurries with and without retarder, and with and without dispersant. For each condition, the following parameters were held substantially constant: stiffening time, dry density target, slump patty size, and core void distribution. The slump test was described in U.S. Patent Application Publication No. 2006-0281837, published Dec. 14, 2006, previously incorporated by reference.

What is claimed is:

1. A gypsum building panel comprising:

a hydrated matrix of hydraulic material, wherein the hydraulic material comprises at least 50% calcined gypsum by weight based on the dry weight of the hydraulic material prior to hydration;

foam;

a defoamer; and